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(54) **CORROSION RESISTANT PEM FUEL CELL**

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(56) **References Cited**

U.S. PATENT DOCUMENTS

5,578,388 A * 11/1996 Faita et al. 429/30

5,728,283 A 3/1998 Reuter et al. 204/499
5,798,188 A * 8/1998 Mukohyama et al. 429/34
5,952,118 A * 9/1999 Ledjeff et al. 429/32

FOREIGN PATENT DOCUMENTS

WO WO96/37005 11/1996

OTHER PUBLICATIONS

"Electrically Conducting Polymers: Science and Technology", Arthur J. Epstein, MRS Bulletin/Jun. 1997 pp. 16-23.

"Cathodic Electrodeposition", A Journal Of Coatings Technology Reprint, M. Wismer et al., pp. 35-44, 5/82.

* cited by examiner

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(57) **ABSTRACT**

A PEM fuel cell having electrical contact elements comprising a corrosion-susceptible substrate metal coated with an electrically conductive, corrosion-resistant polymer containing a plurality of electrically conductive, corrosion-resistant filler particles. The substrate may have an oxidizable metal first layer (e.g., stainless steel) underlying the polymer coating.

8 Claims, 3 Drawing Sheets

